Table of Contents

List of Authors and Contributors ix

Executive Summary 1

Chapter 1: Introduction 17

Chapter 2: Urban Air Pollution Phenomenology 21
- 2.1 Space and time scales in the urban context 21
- 2.2 Flow, dispersion and chemistry / street and receptor scales 24
- 2.3 Flow, dispersion and chemistry / neighbourhood and city scales 26
- 2.4 The interaction between the city and regional scales 29
- 2.5 Connecting the scales 30

Chapter 3: Air Pollutant Emissions in Cities 31
- 3.1 Introduction 31
- 3.2 Requirements for urban emission inventories 31
- 3.3 Methodological approach 34
- 3.4 Quality assurance 37
- 3.5 Uncertainty 37
- 3.6 Applications 40
- 3.7 Intercomparison of urban emission inventories 47
- 3.8 Summary 50

Chapter 4: Urban Field Campaigns 51
- 4.1 Introduction 51
- 4.2 Local scale (street scale) campaigns 52
- 4.3 Urban scale campaigns 69
- 4.4 Other related urban experiments 85
- 4.5 Summary 87

Chapter 5: Particulate Matter in Urban Air 91
- 5.1 Introduction 91
- 5.2 Sources and emissions of particulate matter 95
- 5.3 Spatial and temporal variation – temporal trends 99
- 5.4 Field campaigns involving particulate matter 102
- 5.5 Modelling of particulate matter in urban areas 113
- 5.6 Exposure to urban particulate matter 117
- 5.7 Conclusions 119

Chapter 6: Modelling Urban Air Pollution 121
6.1 Introduction 121
6.2 Classification of urban air pollution models 122
6.3 Urban scale models 132
6.4 Local scale models 137
6.5 Model systems 148
6.6 Future perspectives for modelling urban air pollution 154

Chapter 7: Quality Assurance of Air Pollution Models 155
7.1 Introduction 155
7.2 Fundamentals of Model Quality Assurance 156
7.3 Evaluation of urban scale models 161
7.4 Evaluation of local scale models 171
7.5 Summary 182

Chapter 8: Photochemical Smog in South European Cities 185
8.1 Introduction 185
8.2 Meteorological conditions favouring photochemical smog 187
8.3 Scale interactions and ozone formation 193
8.4 Regional and local emissions of ozone precursors 197
8.5 Indicators of photochemical pollution 205
8.6 The role of aerosols 211
8.7 Real-time ozone forecast models 217
8.8 Long term modelling simulation for ozone exposure assessment 219
8.9 Conclusions 222

Chapter 9: Integrated Urban Air Quality Assessment 223
9.1 Introduction 223
9.2 Purposes and scopes of integration 226
9.3 Integration of elements 228
9.4 Urban Air Quality Management Systems (UAQMS) 234
9.5 Outlook 242
Annex: Description of UAQMS participating in SATURN 244

Chapter 10: Conclusions 265
10.1 Achievements of SATURN 265
10.2 Remaining gaps of knowledge 268

References 271

Subject Index 293

http://www.springer.com/978-3-540-00842-2

Air Quality in Cities
Moussiopoulos, N. (Ed.)
2003, X, 298 p., Hardcover
ISBN: 978-3-540-00842-2